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STS-105/Discovery

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Expedition Three Crew, Early Ammonia Servicer Delivered To ISS

Mission STS-105 is the 11th Space Shuttle flight to the International Space Station (ISS). Crew members of Expedition Three, and several payloads and scientific experiments, will make the journey up to the Station aboard Space Shuttle Discovery. The current Expedition Two crew members on the Station will return to Earth.

Payloads aboard Discovery include the Multi-Purpose Logistics Module (MPLM) Leonardo, on its second flight into space, and an Early Ammonia Servicer (EAS) tank. Several scientific experiments also will be carried aboard Discovery.

The MPLM Leonardo, built by the Italian Space Agency, will be outfitted with 12 racks of experiments and equipment. Six of the racks, known as Resupply Stowage Racks, will carry a re-stock of equipment, clothing, food and supplies for the crew of the ISS. Four racks, known as Storage Resupply Platforms, will carry logistics supplies and hardware. Two specialized racks, called Express Racks, will contain smaller payloads for delivery to the Station. Discovery's crew, using the Shuttle's robotic arm, will transfer the Leonardo module from the payload bay and attach it to the Station. The new racks will be transferred to the Station and used racks of equipment and experiments will be transferred back to Leonardo for the return trip to Earth.

The Early Ammonia Servicer (EAS) tank and two experiment containers will be carried aboard Discovery on an Integrated Cargo Carrier (ICC). During Mission STS-105, the crew of Discovery will remove the Servicer from the ICC and attach it to the Station during two spacewalks. The EAS consists of two nitrogen tanks that provide compressed gaseous nitrogen to pressurize the ammonia tank and replenish it, as needed, in the thermal control subsystems of the ISS. The EAS will remain attached to the Station and provide intermediate ammonia resupply of the ISS ammonia coolant loop until the permanent system is activated on a future mission.

Space Shuttle Discovery will also carry experiments known as Hitchhiker Experiments Advancing Technology (HEAT). The HEAT payload complement consists of three experiments: Simplesat, AMTEC and SEM, which will fly in Discovery's payload bay mounted on two adapter beams on the port and starboard sides of the Shuttle.

Simplesat is an engineering test satellite designed to evaluate the use of inexpensive commercial hardware on spacecraft. Simplesat will be contained within a Get Away Special (GAS) canister with a motorized lid. After the Shuttle is undocked from the Station and has been maneuvered into the proper orbit, the crew of Discovery will deploy the satellite, using a special system called Advanced Carrier Equipment (ACE) avionics. Once deployed, Simplesat's batteries will begin to charge, and scientists will monitor the satellite from the ground. Simplesat's purpose is to demonstrate Global Positioning Satellite (GPS) attitude control and fine pointing control while in low-Earth orbit.

The Alkali Metal Thermal-to-Electric Converter (AMTEC) flight experiment, managed by the Jet Propulsion Laboratory (JPL), will study the efficient conversion of heat into electrical energy. This experiment will be used on the Shuttle and is expected to demonstrate the usefulness of the AMTEC technology for military or commercial satellite power systems and for power systems on NASA outer planetary research missions.

The Space Experiment Module (SEM) is an experiment managed by Goddard Space Flight Center, Md. It is part of an initiative to increase educational access to Space. The SEM canister will contain up to 10 small, enclosed modules, each containing a separate, passive experiment designed and constructed by students. The experiments will remain on the Shuttle during Mission STS-105. Each SEM module and module controller is powered by an internal battery to regulate each experiment's operations, timelines, and activities. Mission STS-105 is the 10th flight of the Space Experiment Module Program, an educational initiative that utilizes the GAS canister.

Other GAS payloads include an experiment from students at Mayo High School in Rochester, Minn., that will study cell growth in microgravity, and a NASA payload from Marshall Space Flight Center, Ala., and Glenn Research Center, Ohio, that will investigate smoldering combustion in a long-term microgravity environment.

Two Materials International Space Station Experiment (MISSE) Containers will carry hundreds of samples ranging from lubricants to solar cell technologies. Crew members of STS-105 will attach the samples to the Station during a spacewalk. The samples will be exposed to the harsh environment of space for one year in order to examine how the coatings fare. The MISSE experiments will help researchers seek new insight into developming materials for future spacecraft, as well as making materials last longer on Earth.

The Crew

Scott J. Horowitz (Ph.D), will serve as commander on his fourth space flight. He served as pilot on STS-75, the re-flight of the Tethered Satellite System and third flight of the Microgravity Payload; STS-82, the second Hubble Space Telescope servicing mission; and STS-101, the third Shuttle mission to the International Space Station. He holds a doctorate in aerospace engineering from the Georgia Institute of Technology. Horowitz has logged more than 853 hours in space. He was born in Philadelphia, Pa., but considers Thousand Oaks, Calif., to be his hometown. He is married and has one child.

Frederick W. "Rick" Sturckow will serve as pilot on Mission STS-105. He served as pilot on his first flight, Mission STS-88, the first International Space Station assembly mission, and logged over 283 hours in space. Sturckow has a Bachelor of Science degree in mechanical engineering from California Polytechnic State University. He was born in La Mesa, Calif., and resides with his wife in Lakeside, Calif.

Mission Specialist **Daniel T. Barry** (M.D., Ph.D), will make his third flight into space aboard Discovery. He served as a mission specialist on two previous missions, STS-72 and STS-96. Dr. Barry has logged over 449 hours in space, including two spacewalks totaling 14 hours. He holds a doctorate in electrical engineering/computer science from Princeton University and a doctorate in medicine from the University of Miami, Fla. He was born in Norwalk, Conn., but considers South Hadley, Mass., to be his hometown.

Patrick G. Forrester will serve as a mission specialist on his first flight aboard Discovery on Mission STS-105. He most recently served as an assistant to the director of Flight Crew Operations at Johnson Space Center. Forrester has a Bachelor of Science degree in applied sciences and engineering from the United States Military Academy, West Point, N.Y. and a Master of Science degree in mechanical and aerospace engineering from the University of Virginia. He was born in El Paso, Texas, and resides in Fort Walton Beach, Fla., with his wife and two children.

Frank L. Culbertson Jr. will fly aboard Discovery as commander of the Expedition Three crew. Culbertson and two other crew members will replace the current Expedition Two crew members aboard the International Space Station. A veteran of two space flights, Culbertson served as pilot on STS-38 and was crew commander on STS-51. He has logged over 344 hours in space. Culbertson most recently served as Deputy Program Manager for Operations of the International Space Station Program. He received a Bachelor of Science degree in aerospace engineering from the U.S. Naval Academy and was awarded an Honorary Doctor of Science degree from the College of Charleston, S.C. He was born in Charleston, S.C., but considers Holly Hill, S.C., to be his hometown. He is married and has five children.

Mikhail Turin, a cosmonaut with the Russian Space Agency, will fly aboard Discovery as a member of the Expedition Three crew. Mission STS-105 is Turin's first space flight. He was born in Kolumna, Russia (about 60 miles from Moscow) and resides with his wife and daughter in Korolev, a small city outside of Moscow. He graduated from the Moscow Aviation Institute with a degree in engineering and a specialization in creating mathematical models related to mechanical flight. He is currently doing work in his field of research.

Vladimir Nikolaevich Dezhurov is a test cosmonaut with the Russian Space Agency. He will make his first Space Shuttle launch aboard Discovery on Mission STS-105 as a member of the Expedition Three crew. Dezhurov served as commander of the prime crew of the MIR-18 mission on his first space flight aboard a Soyuz-TM-21 transport vehicle in March 1995. He returned aboard Space Shuttle Atlantis on Mission STS-71 after a 115-day mission on Mir. Dezhurov has a pilot-engineer's diploma from the S.I. Gritsevits Kharkov Higher Military Aviation School in Russia. He was born in the Yavas settlement, Zubovo-Polyansk district, Mordovia, Russia, and resides there with his wife and two children.

Related NASA Web sites

Mission and crew press kit:www.shuttlepresskit.com/

Mission and crew: spaceflight.nasa.gov/